

**CLAIMS:**

1. A method of encrypting an optical signal to be transmitted via an optical fiber communication link by causing controlled chromatic dispersion of said signal.
2. The method according to Claim 1, for encrypting an optical signal to be transmitted via an optical fiber communication link between a transmitting site and a receiving site, comprising:
 

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 obtaining an original optical signal,  
 at the transmitting site, encrypting the original optical signal by causing a controlled chromatic dispersion thereof,  
 transmitting thus encrypted optical signal,  
 at the receiving site, providing a suitably controlled compensation of the dispersion caused at the transmitting site, thereby decrypting the encrypted optical signal to restore the original optical signal.
3. The method according to Claim 1, comprising causing the controlled chromatic dispersion of the optical signal by using means capable of introducing chromatic dispersion in the optical signal and controlling said means in a predetermined order and combination for distorting said optical signal to a desired extent.
4. The method according to Claim 2, comprising synchronized applying of an encryption key and a decryption key for controlling the chromatic dispersion during the encrypting and the decrypting, respectively.
5. The method according to Claim 4, wherein said encryption key and decryption key are functions of time each reflecting a combination and order of operations affecting chromatic dispersion of the original signal and the encrypted signal, respectively.
6. An encryption device for encrypting an optical signal to be transmitted via an optical fiber communication link, the device being capable of causing controlled chromatic dispersion of said signal.

7. The encryption device according to Claim 6, implemented in the form of a variable dispersion compensation module controlled by an encryption key.
8. The encryption device according to Claim 7, wherein the encryption key is a function of time.
9. The encryption device according to Claim 7, wherein the variable dispersion compensation module comprises a plurality of fiber sections having different dispersion characteristics and selectively connectable to the optical communication link.
10. A decryption device for decrypting an optical signal encrypted by the encryption device according to Claim 6, the decryption device being capable of causing controlled compensation of chromatic dispersion introduced into said signal by the encryption device.
11. A system for encryption of an original optical signal to be transmitted via an optical fiber communication link between a transmitting site and a receiving site, the system comprising
  - a controllable encryption device at the transmitting site, capable of causing for controlled chromatic dispersion of said original signal, and
  - a suitably controllable decryption device at the receiving site, capable of compensating the chromatic dispersion caused at the transmitting site so as to obtain said original signal.
12. The system according to Claim 11, wherein said controllable encryption device is implemented in the form of a variable dispersion compensation module controlled by an encryption key.
13. The system according to Claim 11, wherein said controllable decryption device is implemented in the form of a variable dispersion compensation module controlled by a decryption key.

14. The system according to Claim 11, wherein both said encryption device and said decryption device are controllable in synchronism by an encryption key and a decryption key respectively.
  15. The system according to Claim 14, wherein said keys are functions of time.
  16. The system for encryption according to Claim 11, adapted to a multi-channel optical transmission system.
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